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DESIGN DIRECTOR APPROACH TO PRODUCT DESIGN ENGINEERING EDUCATION

Alexander "Freddie" HOLLIMAN
University of Strathclyde, United Kingdom

ABSTRACT
Like the definition of product design, the hosting of product design degree programmes tends to fall into two categories: art and engineering; Each having their own foci and educational approaches. Some faculties and departments, typically residing in the engineering camp, offer design degrees that provide students with a space to work in a semi-social environment, some even venturing to refer to those spaces as "studios". Few offer a true "studio" environment, a dedicated space for each student to customise and work in. Regardless of the reason for not providing a studio for students, be it a limitation of size of cohorts, available space or necessary funds, there are greater implications on the student experience than purely the lack of physical space.
This paper presents the *Design Director Approach* to product design engineering education as a set of tenets that design educators can adopt in their practice. The *Design Director Approach* can introduce more student engagement opportunities, while embodying a mix of supervisory and coaching approaches, as well as using the psychological perspectives from Transactional Analysis to provide an industry-like interaction with students, providing further benefit and value to their learning experience. Furthermore, this paper concludes with a call to action, challenging design educators to adopt the *Design Director Approach* within their own practice and to engage in a dialogue to evolve it further.

Keywords: Design education, student supervision, design pedagogy

1 INTRODUCTION
Like the definition of product design, the hosting of product design degree programmes tends to fall into two categories: art and engineering; Each having their own foci and educational approaches. Within the arts camp, some faculties and departments offer design degrees that provide students with a space to work in a semi-social environment, some even venturing to refer to those spaces as *studios*. Yet few offer a true *studio* environment, a dedicated space for each student to customise and work in. Regardless of the reason for not providing a studio for students, be it a limitation of size of cohorts, available space or necessary funds, there are greater implications on the student experience than purely the lack of physical space. It is not what the space provides, rather what it enables, and what behaviours it can facilitate that has the greatest potential.
To be clear, this paper does not describe an experiment, nor a comprehensive literature review (although a review or relevant literature has been provided). Instead, readers should consider this a challenge, a thrown-down gauntlet, to design engineering educators to assume, where possible, the role of *Design Director* within their practice. It is the position of this paper that these interactions can be replicated in an educational environment.

2 WHAT IS A DESIGN DIRECTOR?
In industry, most design businesses work within a studio workplace where needs-based teams are formed to per-project. A design director is a senior member of a design business that acts in a supervisory role, normally leading design project teams, while also acting as line manager for the other design team members. Design businesses will likely have more than one design director, with each assuming the role as lead for project work. Visit any practicing design studio and the design directors will work amongst the design team. This coworking allows for oversight of the projects they lead, and to ad hoc discussions on other current projects to take place. These discussions can lead to cross-pollination between project teams, for the natural discussion flow that leads to further questioning and the consummate accumulation of shared understanding of a project, design practice, etc.

Such structuring, organisation and hierarchy are not present in higher education, for many reasons, not least of which as students are not in the employ of the university. Students interact with students during class time, tutorials and labs, and with scheduled meetings, where students will learn many *hard skills* that are vital to their degree. That said, adopting much of the same approach in an educational context will likely offer more support in the development of soft skills rather than hard, which addresses the deficit in soft skill focus found in design education [1], [2], such as interpersonal skills [3].

3 EDUCATION CONTEXT

With various teaching approaches being discussed in the pages of pedagogy, the closest we have to an industry-like studio (a true studio environment) is the studio course. As countless education publications have stated, studio courses are not overly defined by design, with definitions having some variation on being active and adopting practice-oriented approaches to resolve problems in a project-based context [4], [5]. This paper is less concerned with the class time delivery of formal learning outcomes, rather employing some of the same pedagogical techniques outside of the classroom, in a studio-like setting.

The value of industry experience for students has long been recognised [6], with business-related skills (or professional skills) and knowledge being central part of a design curriculum [7] as it prepares students for working life and practices. Where direct engagement with industry is not feasible, a simulated approach is commonly employed, with other academics assuming the role as client. Outside of using a physical studio space to create industry-like working environments, this has tended towards *capstone* projects, which involve industry sponsorship and/or involvement [8]. But why stop there? Regular interaction with more experienced individuals is another facet of industry-based working. Capstone project classes and studio-based teaching enable this to occur during class time. However, as the PBL of capstone projects is only one facet of a design student's experience, clearly there are more touch points between educators and students that can be used to further teach the business skills that are needed and provide other industry-like experiences and development of skills.

4 SIMULATING DESIGN STUDIO WORKING

There are two considerations to simulate design practices in industry: *environment* and *approach*. This section will discuss each in order.

4.1 Design Studio Working - Environment

As the design studio format has been widely adopted in industry, there is a case for training students who will enter that workforce in that appropriate way of working is clear. Studios are open workspaces categorised as Activity-Based Offices (ABOs), that have various specific features, that are shown in **Error! Reference source not found.**. Such spaces have been found to have a net-positive for collaboration [9], [10] striking a balance between worker collaboration and concentration [11]. It is well understood that collaboration is a central part of design, leading to the use of ABO studio workplace layouts where designers collaborate amongst themselves and their leadership who work alongside their team.

Table 1. Features of Activity-based offices. Adapted from Gharaei and Ghomeishi [12]

Office layout	Architectural features	Functional features	Main problems
Activity-based office (ABO)	A main space with meeting rooms or semi-open and closed rooms [13] Has assigned workstations and transparent spaces, Ability to adjust space and furniture based on user activity [14]	Employees can choose their workstations [15] A wide range of types of activities are applicable, Employees can work in any place and at any time [13]	-High ratio of the number of employees to workstations - Lack of specific rules - Lack of concentration and privacy [16], [17]

An ABO for students studying in a product design course may be considered common practice and in engineering design courses, it too may be available in some context. Not everyone in higher education can offer a discrete workspace specifically for engineering design students to work, but they do offer shared working spaces, study rooms, etc. in their libraries and other buildings. However, to replicate a studio working space, replicating the same hierarchy is needed. This means that we must be present in the studio alongside our students. This allows for face-to-face transactions to occur, replicating the most

common information searching behaviour seen in industry [18], [19], which contributes to the gain in trust needed for leadership [20], a quality required for the role of supervisor.

4.2 Design Studio Working - Approaches

Once present in a suitable environment, an educator must consider their approach to maximise the simulation, by considering and assuming the various roles and perspectives that directors take.

4.2.1 Supervisor

In a design environment, a key role of a supervisor is to provide critique and feedback on work. For this to be effective and valuable, any feedback must offer a next step to progress the work [21], by way of suggestion that empowers the designer [22], and be delivered objectively to avoid confrontation [23]. Of Armstrong's types of leaders (*Charismatic, Visionary, Transformational, Transactional* and *Authentic* [24], it is the *Authentic* supervisor that works best in a design education environment, where credibility is built, and respect is earned by following significant personal convictions and values while encouraging diverse viewpoints. The importance of a formal supervisor and student relationship is discussed in depth by Zackariasson and Magnuson [25], highlighting the significance of discussion and communication between students and supervisors.

An *Authentic* leader or supervisor must give more to than instruction to those they work with. Rapport must be developed and working alongside others provides opportunities for guidance and the means to identify areas of improvement and opportunities to try new techniques. In education, that rapport and these potential acts can easily be seen to emulate that of a coach.

4.2.2 Coach

Although there are five main coaching styles (Authoritarian, Intense, Easygoing [sic], Business-Like, and Nice-Guy) [26], there are some behavioural constants, chief among them is being open to questions and willing to provide guidance and advice. This is the case in any context, not least of all in a design environment where coaches can help students understand the contextualisation of theory and practice and deliver just-in-time meaningful information [27]. When not working directly with a specific project or cohort team, may walk between project teams and engage with them in an ad hoc manner. Engaging in general conversation, perform active listening [20] and asking probing questions, and offering nudges towards experiences and resources [28], the coach promotes candid communication and reciprocated proactive inquiry, both integral to effective design teamwork [29]. Mentorship is another aspect of the role of a coach. It cannot be doubted that mentoring is a valuable approach to learning in a one-to-one interaction, which has shown to offer improved experiential learning in comparison to conventional formal educational approaches [30]. With any one-to-one interaction, there are roles that can be adopted to maximise its inherent quality. Coaches from many walks of life have turned to psychology to help with their practice and to get the most out of those they coach. As coaches in a design education context, we too can take a simple, yet effective standpoint to achieve effective interactions and relationships with those we *supervise* this through the psychological principles of Transactional Analysis.

4.2.3 Transactional analysis

Eric Berne's Transactional Analysis (TA) [31] considers the interactions between individuals, where participants adopt one of three ego-states (what one might consider roles); *Parent, Child* and *Adult*. Parent ego states do not mean a familial relation to the child, rather it is based on a position of authority and influence. There are two *Parent* states: *Nurturing Parent* and *Controlling Parent*; are focused on the past and adopt either a caring or concerned stance providing safety or imposing their own viewpoints respectively on those in a child ego state.

As with the *Parent* states, a *Child* ego state has no connection with an age difference, or familial link to those in a *Parent* state, nor is it to do with childish behaviour, rather its reactionary behaviour, focusing on past actions and outcomes. There are varying schools of thought as to how many *Child* ego states there are, but it is generally accepted that two of them: *Adapted Child* and *Free Child*. Those in an *Adapted Child* state will look to past to identify what received praise, or admonishment, acting in accordance with the wishes of others (in an assumed *Parent* state). Whereas those in a *Free Child* state are spontaneous and creative.

Unlike *Child* and *Parent*, the *Adult* ego state is the only one that focuses on the present, with rational thoughts and behaviours. Those in an *Adult* state think and act without the influence of past conditioning.

TA suggests that the crossed interaction between individuals in *Parent* and *Child* ego states each will ultimately result in friction and that therefore we should strive towards an overall complementary *Adult* to *Adult* transaction between staff and student. That said, during any transaction, there will be natural deviations from the *Adult* state but that the overall characteristic will remain *Adult*.
Although originally developed initially for use in psychotherapy, TA principles are now taught to those in supervisory and mentoring positions within sports [21], as well as various industries [32], [33].

5 THE DESIGN DIRECTOR TENETS

By identifying and understanding the constituent attributes and roles that a design educator can take, we can collate them to create an approach that provides industry-like interactions outside of class time and formally scheduled meetings. Adopting the *Design Director Approach* as an educator is not to be fully adopt the role as a supervisor, a coach, or a psychologist, nor is it to spend the entire working week among students; It is to embrace the various characteristics and qualities of each while critically remaining physically present for your students. Synthesised from the above discussion, the following are the Design Director Tenets (**Error! Reference source not found.**) designed for those in design education to follow and embrace.

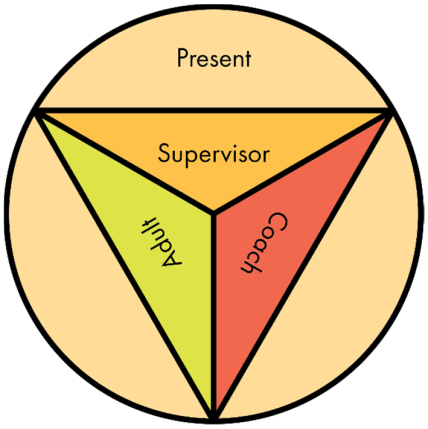

Figure 1
The Design Director Tenets

A Design Director:

Is **present**,
working alongside their students to enable organic interactions and to simulate a working environment.

Is part **supervisor**,
being an authentic leader with personal values and convictions, regularly communicating with their students offering ad hoc critique and feedback on work and positing challenging questions.

Is part **coach**,
offering guidance and advice on various relevant topics so that information of the highest quality is meaningfully obtained by their student.

Is an **adult**,
conscious of the roles and dynamics that are had with their students and strives for a balance between parent-child and adult-adult interactions.

6 CONCLUSION & FUTURE WORK

The value that industry-based skills and knowledge are a critical part of design education to prepare students for life at work. Design educators strive to facilitate opportunities for industry-like experiences in class and coursework, but there are more opportunities that should be capitalised on. This paper presents the *Design Director Approach* and its tenets through a discussion on the value that design educators working in the same environment have for their students.
Of course, it is acknowledged that this may be more difficult than just *being present* for their students. Universities are not necessarily full of spare activity-based workspaces and so having the space to be a design director might be a challenge. However, staff can bring aspects of this to other workspaces that students work in, such as university libraries, etc.
This approach clearly needs to be tested, regardless of whether or not there is agreement with the worldview of the author. Without concrete evidence that it indeed has a net positive for students, it is just words. Testing with variations to this approach, for example how long per day or week should be spent with the students; variations with cohort types (i.e. first year undergraduates, final year students, all students, etc.) and even cultural differences need to be examined. This will require coordination between many educators and many universities to achieve effectively.
One possible research approach would be to run classes in the currently adopted approach for the first semester of an academic year, logging the time and type of interaction and with which students both during and outside of class time. At the end of the semester, send a questionnaire to the student cohort to establish a benchmark for levels of satisfaction, confidence in work and other relevant aspects. The

following semester, adopt the *Design Director Approach* while continuing to log every interaction as before. At the end of the second semester, circulate a second questionnaire with the same questions to identify what changes or differences were experienced. Differences between cohort composition, experiences and other factors would need to be considered, along with any institution teaching doctrines and curriculum differences.

6.1 A Call to Action

Consider this paper a challenge to all those readers who are design educators, to embrace these tenets in their own practice. Some of you may already follow, either consciously or tacitly, some or all of them. If so, keep going. Some of you may see the significant challenge these tenets present, the logistics, coordination and even the availability of space. In that case, try some of it; Apply the tenets where you can. The goal of this paper is to get this community to test the *Design Director Approach;* To observe those casual, ad hoc and serendipitous interactions with students that it may facilitate; and critically, to use these experiences to start a dialogue within this community to co-develop some best practices and to evolve the *Design Director Approach* further.

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